

CASE STUDY:

Prism and Prismless Monitoring

MAKING MINING SAFER

RELIABLE PRISM AND PRISMLESS MONITORING IN AN OPEN-CUT GOLD OPERATION

Providing total monitoring flexibility, GroundProbe's GMS-Dual (Geotech Monitoring Station) can monitor using both prism points - which are paired with physical prisms installed on the pit wall - and virtual points - which are virtual prisms that can be placed digitally on the wall in GroundProbe's patented SSR-Viewer software.

At Filminera Resources Corporation's Masbate Gold Project, an open-cut gold mine in the Philippines, the loss of a significant number of physical prisms due to vandalism had compromised the site's ability to detect and measure deformation, thereby reducing the on-site geotechnical team's confidence to effectively manage risk.

As a result, the GMS-Dual was deployed to the site - which is currently undergoing an active production stage - to provide long-term, broad-area, background monitoring.

"The GMS-Dual was selected due to its unique prismless monitoring functionality whereby users are able to detect deformation across the slope by placing virtual points anywhere on the wall within SSR-Viewer, our geotechnical monitoring and analysis software."

Fernanda Carrea, Product Manager, GroundProbe.

"The GMS-Dual is then able to reflect its laser signal directly off the rock, corresponding to the exact location and placement of the virtual points in SSR-Viewer, allowing it to detect hotspots of movement across the area of interest," said Ms Carrea.

Virtual points can also be utilised when monitoring areas that are difficult, dangerous or even impossible to physically reach, consequently inhibiting the installation of physical prisms.

In addition, as many virtual points as needed can be placed in as many locations as required, allowing the GMS-Dual to detect deformation across vast areas and at long-range.

The GMS-Dual was easily deployed in just minutes and positioned looking down to one of the mine's main pits, where hundreds of virtual points were digitally placed on the slope.

"Within days of monitoring, the GMS-Dual provided extensive practical data on the overall stability of the pit," said Prastowo Harymurty, GroundProbe's Technical Specialist who deployed the system.

"It also proved its competency in detecting and tracking both positive and negative deformation trends across each of the different types of points; Prism Points, Pixel Points and



The GMS-Dual monitored continuously and without interruption, successfully detecting sub-millimetre movement, reflecting its high accuracy and precision.

“The data gathered enabled the on-site geotechnical team to identify areas with differentiated geotechnical behaviours and deformation trends; for example, some zones featured no significant movement while others either presented noticeable linear or regressive deformation trends,” said Mr Harymurty.

Blasting activity in the lower benches of the pit were also monitored using virtual points to provide geotechnical peace of mind.

Using SSR-Viewer’s intuitive visualisation tools, the geotechnical team could pinpoint hotspots of movement across the pit, represented visually through a colour gradient heatmap which was draped over the top of a photographic representation of the area.

The geotechnical team were also able to perform a velocity analysis and even conduct remote inspections of the areas of interest in real-time using the GMS-Dual’s built-in telescopic camera.

Additionally, the system’s ability to monitor both prism and virtual prism points allowed the geotechnical team to monitor the remaining prisms installed on the pit walls,

providing three-dimensional displacement data of these points in real-time.

“Thanks to the GMS-Dual and its prismless monitoring, we have been able to counteract the lack of continuous, real-time slope monitoring caused by the unauthorized removal and vandalism of physical prisms by intruders.”

Peter Alip, Chief Geotechnical Geologist, Masbate Gold Project.

“Moving forward, our geotechnical team is excited to incorporate the system into our permanent on-site monitoring processes and procedures thanks to its easy setup, user-friendliness and smart data capture,” said Mr Alip.

“We are eager to continue using the GMS-Dual for effective slope stability in order to detect hazards early, make confident decisions and manage risk, without having to rely solely on physical prisms.”